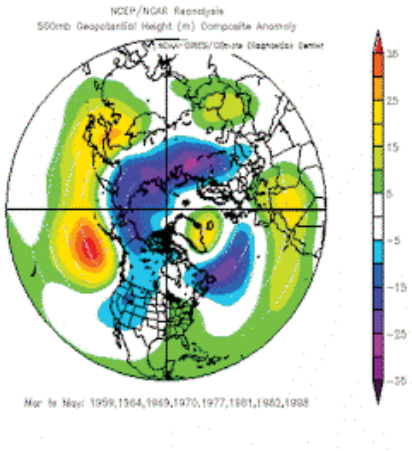
The Pennsylvania Observer

The Pennsylvania State Climatologist



March Climate Highlight:

Prepared by Wade Paxson

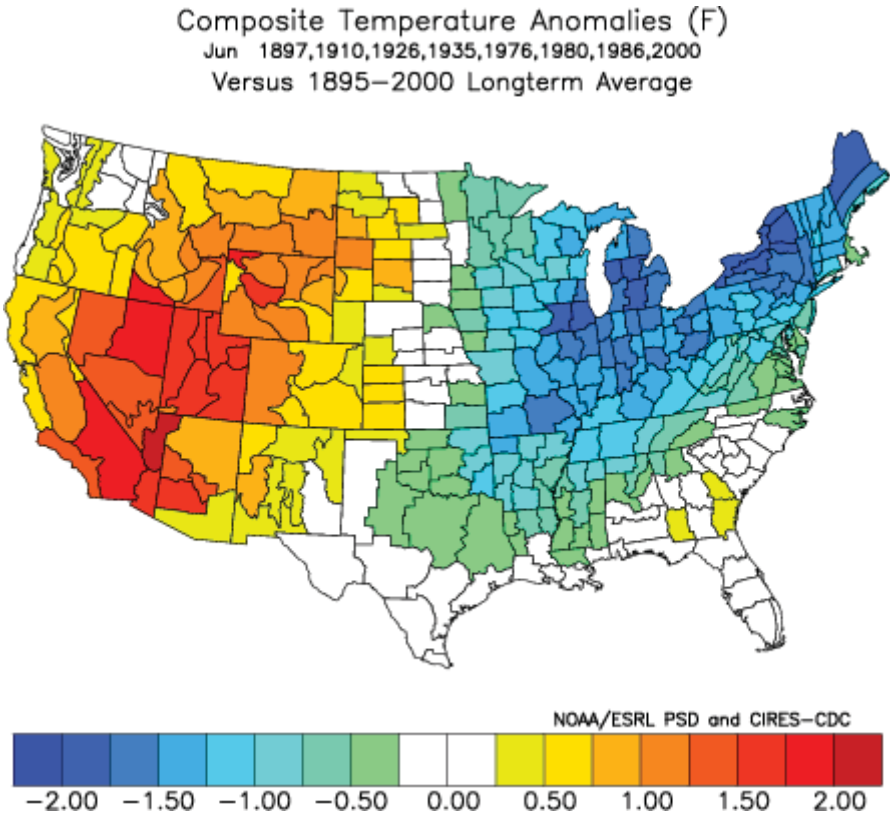
Two climate highlights are featured in this month's newsletter. The first highlight utilizes Pennsylvania's average monthly temperatures from November, December and January in order to predict the temperature anomalies during the upcoming summer months. The second climate highlight focuses on the Arctic Oscillation (AO), which has been negative for the past 90 days. Seasons in which the AO has been largely negative were used in order to predict the U.S. temperature anomalies for the last third of March.

Expected Summer Temperature Anomalies:

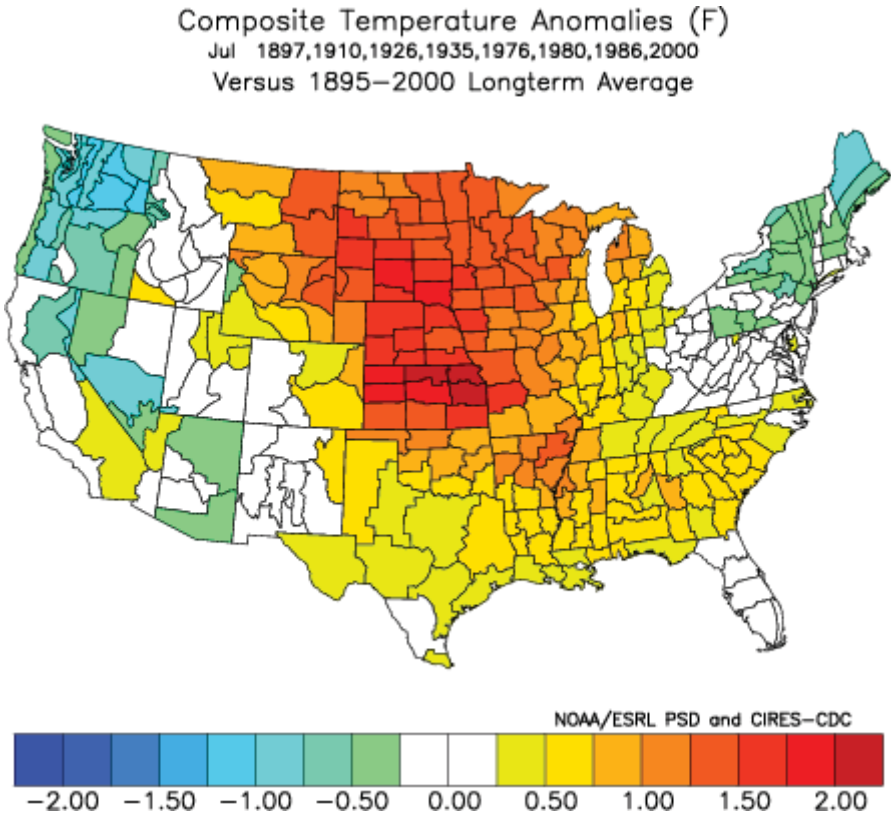
What does Pennsylvania's average monthly temperature for November, December and January mean for the United States in the upcoming summer in terms of temperature anomalies? To determine this we need to look at the years that had Novembers, Decembers and Januarys most like the ones we had this winter and then use the common years to put together a composite of temperature anomalies for June, July and August.

November:			December:			January:	
Year	Temperature		Year	Temperature		Year	Temperature
1979	43.8		1898	28.6		1910	25.8
2006	44.1		1924	28.6		1929	25.9
1896	44.6		1930	28.8		1927	26
1927	44.8		1947	29		1942	26
1948	44.9		1896	29.4		1958	26
1985	44.9		1934	29.4		2000	26.1
1994	44.9		1961	29.4		1896	26.2
2003	44.9		1925	29.5		1935	26.2
1909	45		1954	29.5		1941	26.3
1999	45.2		1988	29.5		1926	26.4
2009	45.2		2009	29.5		2010	26.4
1975	45.7		1906	29.6		1917	26.5
1902	45.9		1966	29.6		1954	26.5
2001	46		1993	29.8		1986	26.5
1931	48		1908	30		1980	26.6
			1899	30.3		2001	26.6
			1922	30.3		2005	26.6
			1921	30.4		1924	26.7
			1975	30.5		1956	26.7
			1933	30.7		1915	26.9
			1908	30.8		1908	27

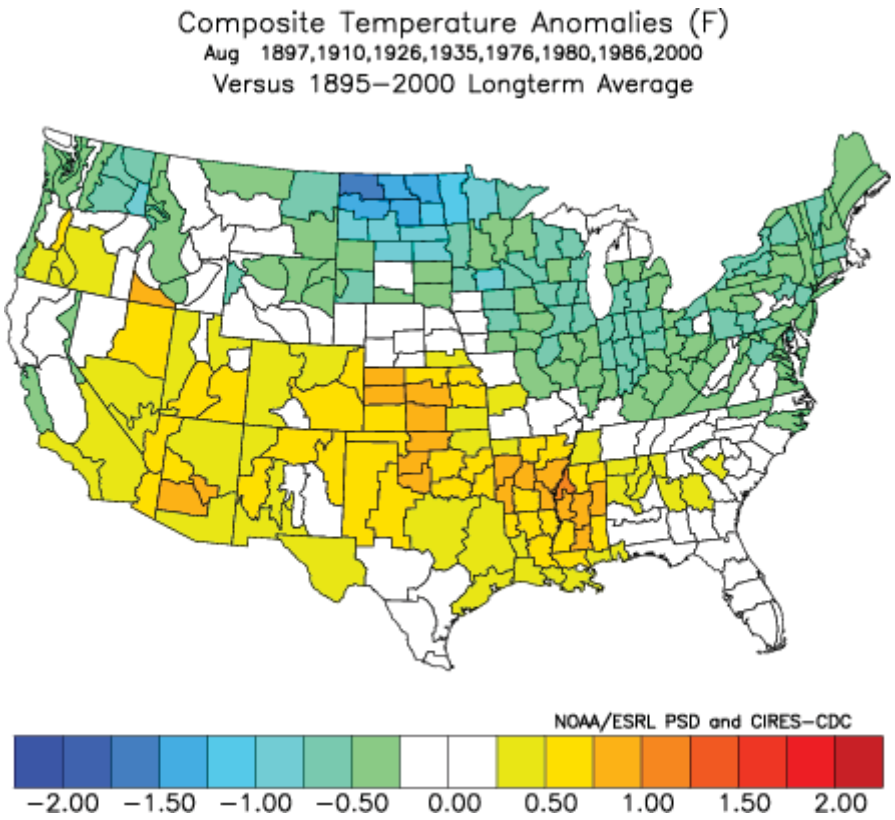
This chart shows the Pennsylvania average monthly temperature for the years most in common with this winter, usually the 10 above and below (less in case of this November which was the 5th warmest since 1895). The shaded years (except 2009-2010) were then used to create a composite which shows the average temperature anomaly for those years



This graph of average temperature anomalies for the month of June, based off of our common years, shows the Northeast through the Midwest all the way into Texas receiving below average temperatures. The Southeast by this method will experience an average June along with parts of the Great Plains. Nearly the entire western half of the country can expect above average temperatures.



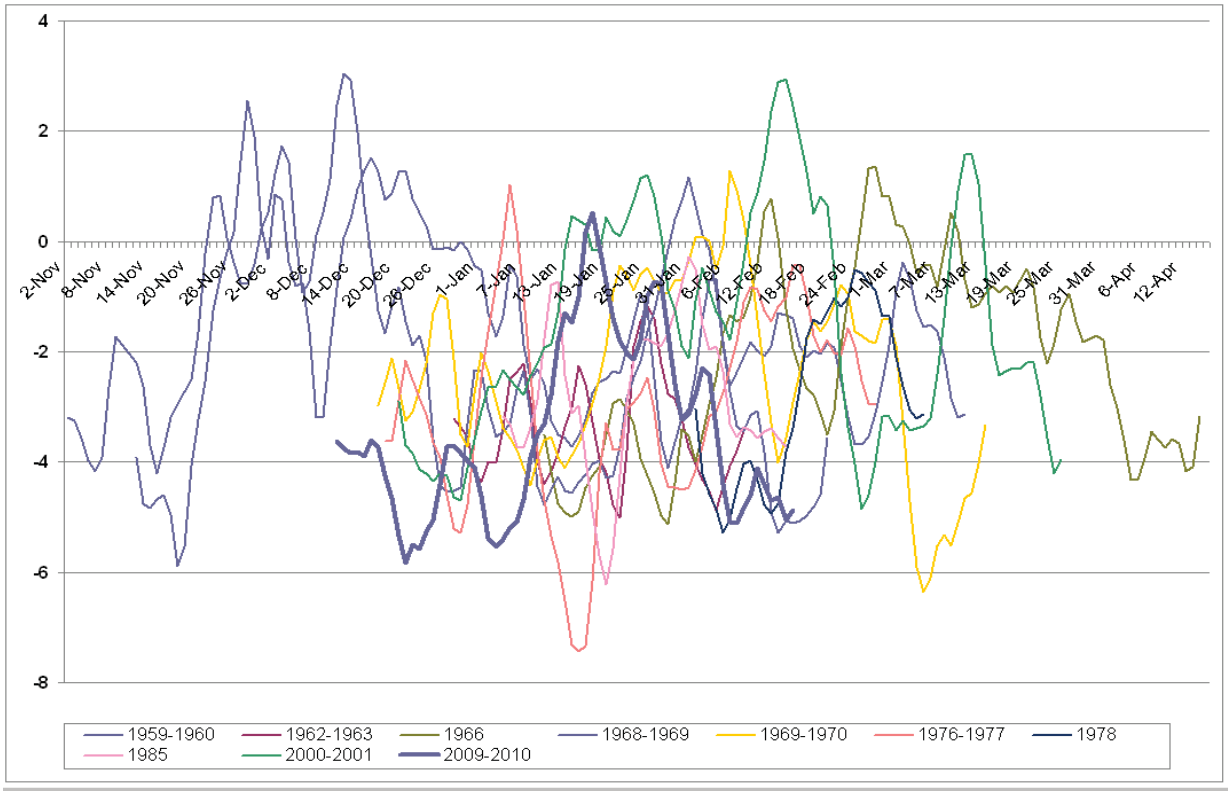
This graph, made by the same method as before predicts the temperature anomalies for the month of July. Much of the Northeast may experience an average if not slightly cool July. The Southeast through the Midwest and west through the heart of the country might expect an above average July. The Rocky Mountain chain will be about average with slightly below average departures expected on the west coast.



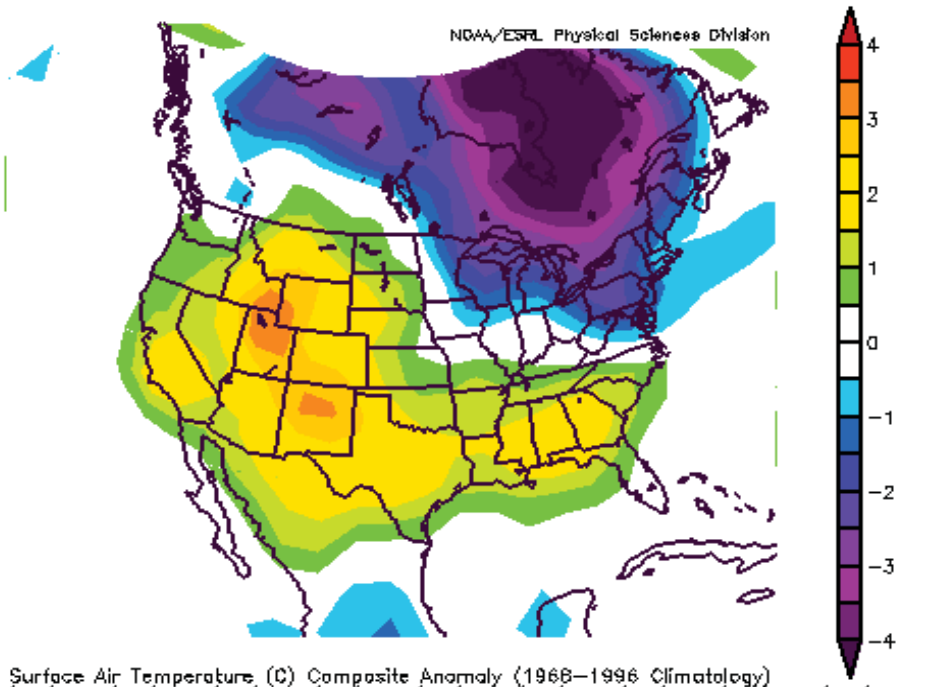
August will see more of a pronounced north-south split for the departures. The North East and westward through the Mid West into Montana can expect a below average month. The South East will be around average as will a strip of the country running from Montana through the Carolinas. Everyone south of that line might see an above average month.

Expected Late March Temperature Anomalies:

Meridional flow has dominated the winter weather across North America since December. The Arctic Oscillation (AO), a measure of the mean westerly flow in the higher latitudes of the Northern Hemisphere, has consistently been negative for the last 90 days. The graph below compares the cold seasons since 1950 when the AO has been largely negative (and below a value of -3) for long spells.



The dark, thicker line represents 2009-2010 season to date. The years that were most similar to this winter (length, multiple minima and period [Dec-Feb]) are:
1963; 1969; 1970; 1978; 1985 – while 1960, 1966, 1977 and 2001 are not as similar and are weighted less in the composite U.S. temperature anomalies for the last third of March:



Surface Air Temperature (C) Composite Anomaly (1968–1996 Climatology)
3/31/63 3/31/69 3/31/69 3/31/70 3/31/70 3/31/75 3/31/75 3/31/85 3/31/85 3/31/80 3/31/88 3/
NCEP/NCAR Reanalysis